# National Climatic Data Center

# DATA DOCUMENTATION

# FOR

# DATA SET 9641A (DSI-9641A)

**WORLD METEOROLOGICAL ORGANIZATION**
**1961-1990 GLOBAL STANDARD NORMALS**

## December 18, 2002

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**Table of Contents**

**1. Abstract:** This data set contains 1961-1990 global standard climate normals for over 4000 stations worldwide computed by more than 135 countries and territories. The major parameters that make up this data set consist of: maximum temperature, minimum temperature, mean temperature, soil temperature, precipitation, snowfall, snow depth, wet bulb temperature, dew point temperature, relative humidity, sea level pressure, vapor pressure, wind speed and direction, cloud cover, sunshine duration, solar radiation, evaporation, number of days with various weather elements (occurrence/nonoccurrence), and number of days with weather parameters beyond various threshold values. The statistics include: mean, median, quartiles, extremes, frequency distribution, standard deviation, and number of years with non-missing data. The normals data were computed by the Member countries and territories of the World Meteorological Organization (WMO) and submitted to the National Oceanic and Atmospheric Administration's National Climatic Data Center (World Data Center-A for Meteorology) for collection and processing. The quality assurance process consisted of extreme limits checks and consistency checks. The global standard normals are prepared worldwide once every 30 years.

**2. Element Names and Definitions:**

The WMO (World Meteorological Organization) global standard climate normals are archived in three files: the station metadata file, the narrative metadata file, and the normals data file. The information in this data set was provided by WMO Member countries and territories, and was processed and archived by the NCDC.

The data in each of the three files, have the following specifications:

| | |
|---|---|
| Record Length | : Fixed 208 characters |
| Blocked | : 10400 characters |
| Media | : ASCII 18-Track IBM-Type 3480 cartridge |
| Parity | : Odd |
| Label | : ANSI Standard Labeled |

**STATION METADATA FILE**

The station metadata are archived by station sort (region number, country code, WMO station number, national identification number). Some stations do not have a WMO station number. A pseudo-WMO station number was assigned to these stations and generally consists of 000 in the right-most three positions of the five-digit WMO station number, and these stations also have a national identification number either assigned by the submitting country or assigned by the NCDC. Some stations do not have a national identification number. Each station is uniquely identified by its [region number-country code-WMO station number-national identification number] aggregate information.

The station metadata consists of information that identifies the station and includes: WMO region number; WMO international index number; location information (latitude, longitude, elevation) and station name as provided by the WMO Member; location information and station name as published in the May 1996 WMO Publication No. 9, Vol. A-Stations (for those stations with a WMO international index number); country code and name; and station name as it appears in the 1961-1990 WMO Global Standard Normals publication (for the published stations). The amount of metadata that was provided varied greatly from Member to Member. Some Members provided complete metadata, some provided limited metadata (with the NCDC identifying the remaining metadata from other sources), and some provided no metadata (other than the WMO station number or only the station name). In a few cases (less than a dozen stations), the

station is identified by only an international index station number which could not be located in the WMO Publication No. 9, Vol. A-Stations.

Each station metadata record has the following record format (a blank-filled field indicates the information was not provided or is not available, or is not applicable for the station):

| POSITION | WIDTH | TYPE | CONTENTS |
|---|---|---|---|
| 001-001 | 1 | numeric | region number assigned by the NCDC (see Table 1) |
| 002-003 | 2 | alpha | two-character country identifier code assigned by the NCDC (see Table 2) |
| 004-008 | 5 | numeric | WMO international index station number (if 000 appears in the right-most three positions, then this is a pseudo-WMO station number assigned by the NCDC) |
| 009-016 | 8 | alpha | national station identification number |
| 017-017 | 1 | alpha | national station identification code (see Table 3) |
| 018-018 | 1 | numeric | WMO international index station number flag (see Table 4) |
| 019-020 | 2 | numeric | latitude (degrees) provided by Member (value: 00 to 90) |
| 021-022 | 2 | numeric | latitude (minutes) provided by Member (value: 00 to 59) |
| 023-023 | 1 | alpha | latitude (hemisphere) provided by Member (value: N=North, S=South) |
| 024-026 | 3 | numeric | longitude (degrees) provided by Member (value: 000 to 180) |
| 027-028 | 2 | numeric | longitude (minutes) provided by Member (value: 00 to 59) |
| 029-029 | 1 | alpha | longitude (hemisphere) provided by Member (value: E=East, W=West) |
| 030-035 | 6 | numeric | station elevation above (or below) Mean Sea Level (meters) provided by Member |
| 036-037 | 2 | numeric | latitude (degrees) from WMO Publication No. 9, Vol. A-Stations (value: 00 to 90) |
| 038-039 | 2 | numeric | latitude (minutes) from WMO Publication No. 9, Vol. A-Stations (value: 00 to 59) |
| 040-040 | 1 | alpha | latitude (hemisphere) from WMO Publication No. 9, Vol. A-Stations (value: N=North, S=South) |
| 041-043 | 3 | numeric | longitude (degrees) from WMO Publication No. 9, Vol. A-Stations (value: 000 to 180) |
| 044-045 | 2 | numeric | longitude (minutes) from WMO Publication No. 9, Vol. A-Stations (value: 00 to 59) |
| 046-046 | 1 | alpha | longitude (hemisphere) from WMO Publication No. 9, Vol. A-Stations (value: E=East, W=West) |
| 047-050 | 4 | numeric | station elevation above (or below) Mean Sea Level (meters) from WMO |

| | | | |
|---|---|---|---|
| | | | Publication No. 9, Vol. A-Stations |
| 051-056 | 6 | numeric | barometer elevation above (or below) Mean Sea Level (meters) provided by Member |
| 057-090 | 34 | alpha | station name provided by Member |
| 091-136 | 46 | alpha | station name from WMO Publication No. 9, Vol. A-Stations |
| 137-158 | 22 | alpha | station name as printed in the corresponding 1961-1990 WMO global standard normals publication (for those published stations) |
| 159-208 | 50 | alpha | name of country or territory |

Tables 1 through 4 are discussed in Appendix A-1: Data and Metadata Code Tables.

**NARRATIVE METADATA FILE**

The narrative metadata are archived by country code sort and consist of narrative descriptions of the normals data, computational procedures, special cases, and any other information the WMO Member thought important, as submitted by the Member. Fewer than half of the Members who provided normals data also provided narrative metadata. Most Members who provided narratives provided the narrative in English, but a few provided narratives in their national language. Some Members provided more than one set of narrative metadata documents. The format of the narrative document varied from Member to Member. All of the narrative documents were reformatted to conform to the following record format:

| POSITION | WIDTH | TYPE | CONTENTS |
|---|---|---|---|
| 001-002 | 2 | alpha | two-character country identifier code assigned by the NCDC (see Table 2) |
| 003-003 | 1 | numeric | narrative metadata document number |
| 004-007 | 4 | numeric | line number within the indicated narrative document |
| 008-008 | 1 | alpha | not used (blank) |
| 009-208 | 200 | alpha | descriptive narrative provided by Member |

Table 2 is discussed in Appendix A-1: Data and Metadata Code Tables.

**NORMALS DATA FILE**

The WMO global normals data are archived by station sort (region number, country code, WMO station number, national identification number) then parameter (climatic element, statistic, qualifier code).

Each data record consists of station identification information, data period, parameter information, normals data values, and quality assurance (QC) codes.

Some Members provided monthly normal values but not annual normal values, some provided annual normal values but not monthly normal values, and some provided both monthly and annual normal values. In some cases, the Member computed the annual normal value from the monthly normal values (but did not take into account rounding errors). In other cases the Member computed the annual

normal value from the sequential annual values over the normals period. The annual values as provided by the Member are included in the normals data file. Also included are annual values computed by the NCDC from the monthly values that were provided using a rigorous rounding methodology.

The WMO Secretary-General, in Circular No. M/CLC, specified a list of requested parameters and desired (optional) parameters, and the requested units resolution for each parameter, which the WMO Members were asked to provide for the 1961-1990 global standard normals project. The parameters and units resolution that were, in fact, provided varied from Member to Member. Some Members submitted their data in units or to a resolution different from that requested. Where necessary, the data were converted to the requested units before being added to the database.

A three-tiered parameter coding system was developed to accommodate the large variety of parameter descriptions that were submitted. The climatic element-statistic-qualifier codes were assigned to the submitted parameters based on the Members= description of the parameters. In some instances, the parameter description was very limited. The parameter coding system used here consists of a climatic element code, a statistic code, and a qualifier code. The climatic element and statistic codes are required for each record to describe the basic parameter submitted. In some cases, a qualifier code is needed to further identify certain aspects of the element or statistic. For example, qualifiers are used to specify temperature and precipitation threshold values (for mean number of days with), wind directions (for wind frequencies), measurement depth (for mean soil temperature), statistic (for number of years normals value based on), etc.

The WMO distinguishes between provisional and standard normals. Normals are computed from data over a 30-year period, defined by international agreement as three consecutive decades. If there is too much missing data or the data are not adjusted for inhomogeneities, the computed normals are considered to be provisional. A provisional normal is defined here as a normal that is based on an insufficient period of record (for any of the 12 months, either more than 5 years are missing, or 3 or more consecutive year-month values are missing, or both). Otherwise, the normal is considered to be a standard normal. The homogeneity question is addressed separately here by the specific standard/provisional normal and homogeneity indicator code used (see Table 5). In many cases, the Member did not provide information on the homogeneity issue. The user is referred to the standard/provisional normal and homogeneity indicator code and any narrative metadata provided by the Members for the available information that addresses the homogeneity issue.

The normals data consist of decimal values, integer values (for some elements, and for year and year/date values), and special codes. The special codes are defined as follows:

| CODE VALUE | DEFINITION |
|---|---|
| -9999.9 | code for missing value |
| -9999 | code for missing value |
| -9797.9 | code for value > 0.0 but < the smallest unit at the archived precision |
| -97979 | code for value > 0 but < the smallest unit at the archived precision |
| 88888.8 | trace value for precipitation, rainfall, snowfall |
| 8888888 | trace value for precipitation, rainfall, snowfall |
| 32 | a value of 32 for the day of occurrence indicates no |

| | |
|---|---|
| | precipitation occurred in the period of record at the station (Sudan) |
| 33 | a value of 33 for the day of occurrence indicates the daily extreme event occurred several times |
| 1999 | a value of 1999 for the year of occurrence indicates the monthly extreme event occurred several times |
| 199999 | a value of 199999 for the year and day of occurrence indicates the daily extreme event occurred several times |

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Each normals data record has the following record format:

| POSITION | WIDTH | TYPE | CONTENTS |
|---|---|---|---|
| 001-001 | 1 | numeric | region number assigned by the NCDC (see Table 1) |
| 002-003 | 2 | alpha | two-character country identifier code assigned by the NCDC (see Table 2) |
| 004-008 | 5 | numeric | WMO international index station number (if 000 appears in the right-most three positions, then this is a pseudo-WMO station number assigned by the NCDC) |
| 009-016 | 8 | alpha | national station identification number |
| 017-017 | 1 | numeric | national station identification code (see Table 3) |
| 018-021 | 4 | numeric | first year of period which normals or extremes are based on |
| 022-025 | 4 | numeric | last year of period which normals or extremes are based on |
| 026-026 | 1 | numeric | standard/provisional normal and homogeneity indicator code (see Table 5) |
| 027-028 | 2 | alpha | climatic element code (see Table 6) |
| 029-030 | 2 | alpha | statistic code (see Table 7) |
| 031-036 | 6 | alpha | element-statistic qualifier code (see Table 8) |
| 037-037 | 1 | alpha | code indicating which QC tests were performed on the values in this record (see Section 16. DATA QUALITY: Quality Statement) |
| 038-044 | 7 | numeric | normals data value for January (real with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 045-045 | 1 | alpha | test failure QC code for January (see Section 16. DATA QUALITY: Quality Statement) |
| 046-052 | 7 | numeric | normals data value for February (real with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 053-053 | 1 | alpha | test failure QC code for February (see Section 16. DATA QUALITY: Quality Statement) |
| 054-060 | 7 | numeric | normals data value for March (real |

| | | | |
|---|---|---|---|
| | | | with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 061-061 | 1 | alpha | test failure QC code for March (see Section 16. DATA QUALITY: Quality Statement) |
| 062-068 | 7 | numeric | normals data value for April (real with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 069-069 | 1 | alpha | test failure QC code for April (see Section 16. DATA QUALITY: Quality Statement) |
| 070-076 | 7 | numeric | normals data value for May (real with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 077-077 | 1 | alpha | test failure QC code for May (see Section 16. DATA QUALITY: Quality Statement) |
| 078-084 | 7 | numeric | normals data value for June (real with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 085-085 | 1 | alpha | test failure QC code for June (see Section 16. DATA QUALITY: Quality Statement) |
| 086-092 | 7 | numeric | normals data value for July (real with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 093-093 | 1 | alpha | test failure QC code for July (see Section 16. DATA QUALITY: Quality Statement) |
| 094-100 | 7 | numeric | normals data value for August (real with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 101-101 | 1 | alpha | test failure QC code for August (see Section 16. DATA QUALITY: Quality Statement) |
| 102-108 | 7 | numeric | normals data value for September (real with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 109-109 | 1 | alpha | test failure QC code for September (see Section 16. DATA QUALITY: Quality Statement) |
| 110-116 | 7 | numeric | normals data value for October (real with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 117-117 | 1 | alpha | test failure QC code for October (see Section 16. DATA QUALITY: Quality Statement) |
| 118-124 | 7 | numeric | normals data value for November (real with explicit decimal point, or integer, depending on climatic |

| | | | |
|---|---|---|---|
| | | | element; see Table 6) |
| 125-125 | 1 | alpha | test failure QC code for November (see Section 16. DATA QUALITY: Quality Statement) |
| 126-132 | 7 | numeric | normals data value for December (real with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 133-133 | 1 | alpha | test failure QC code for December (see Section 16. DATA QUALITY: Quality Statement) |
| 134-141 | 8 | numeric | annual normals data value provided by Member (real with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 142-142 | 1 | alpha | test failure QC code for annual value (see Section 16. DATA QUALITY: Quality Statement) |
| 143-150 | 8 | numeric | annual normals value computed by the NCDC from the monthly values provided (real with explicit decimal point, or integer, depending on climatic element; see Table 6) |
| 151-208 | 58 | alpha | not used |

Tables 1 through 3 and 5 through 8 are discussed in Appendix A-1: Data and Metadata Code Tables.

**3. Start Date**: 180001XX (normals cover 1961-1990, extremes cover period of record)

**4. Stop Date**: 19931231 (normals cover 1961-1990, extremes cover period of record)

**5. Coverage**: Global.

a. Southernmost Latitude: 90S
b. Northernmost Latitude: 90N
c. Westernmost Longitude: 180W
d. Easternmost Longitude: 180E

**6. How to Order Data**:

Ask NCDC's Climate Services about the cost of obtaining this data set.
Phone: 828-271-4800
FAX: 828-271-4876
E-mail: NCDC.Orders@noaa.gov

**7. Archiving Data Center**:

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, NC 28801-5001
Phone: (828) 271-4800.

**8. Technical Contact:**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, NC 28801-5001
Phone: (828) 271-4800.

**9. Known Uncorrected Problems:** The normals data were computed by each respective WMO Member country or territory. The WMO provided guidance for the computation of the normals, and some contributing Members described their computational procedures. If the Member did not indicate how they computed the normals, however, it is not known if they followed WMO guidance for estimating missing data values, adjusting for inhomogeneities, and computing the normals statistics. The normals were converted to a common digital format and, with few exceptions, added to the database as submitted.

**10. Quality Statement:** Limited quality assurance (QC) procedures were applied to some parameters as a check of the data entry and keying process. The QC consisted of four categories of tests:

1. Absolute limits checks (abbreviated AAbs@ in the following tables).

2. Internal consistency checks between elements and statistics (abbreviated AInt@ in the following tables).

3. Comparison of the 1961-1990 normals values submitted as part of this project to the corresponding 1971-1980 means which were part of the World Weather Records (WWR) (abbreviated ACom@ in the following tables).

4. Internal consistency check between the annual value (where available) and the monthly values (abbreviated AYear@ in the following tables). The annual value was compared to the mean or sum of the monthly values, as appropriate.

The first three categories of QC tests were performed on both the monthly and annual values. The fourth category of tests was performed on only the annual values. The specific tests that were performed in each category varied with category and depended on the elements and statistics submitted by the Member. Column 37 of the data record contains a code indicating which categories of tests were performed on the values in the record. A code appears adjacent to each monthly and annual value which indicates the results of these tests for the value (this is the Atest failure@ QC code). It should be noted that the test failure QC code indicates only if the data value failed a test; it does not indicate if the value is in error. It is possible for a valid normals data value to fail a QC test if it is beyond the specified limits for the parameter or if the procedure utilized in the computation of the normals data value resulted in an apparent inconsistency. (A few examples of this include: high altitude stations may be windier than the extreme wind speed limit; some stations may have 1961-1990 normals which are considerably different from the 1971-1980 WWR means due to the variability of the parameter from decade to decade for those locations.)

The set of tests performed on the data (indicated by the code in column 37) prescribes the range of possible test failure QC code values that each monthly/annual value on that record can have. The column 37 code values are

defined in Table 16A. The monthly/annual test failure QC code values are defined in Table 16B.

Table 16A (below). QC code values for column 37, indicating which categories of tests were performed (AY@ indicates tests in this category were performed, A-@ indicates tests in this category were not performed). The corresponding allowable test failure QC codes for the monthly/annual normals values follow.

| Test Performed | | | | QC Code for | Allowable Table 16B Codes | |
|---|---|---|---|---|---|---|
| Abs | Int | Com | Year | Column 37 | Monthly | Annual |
| Y | - | - | - | I | AI | AI |
| Y | Y | - | - | M | AEIM | AEIM |
| Y | - | Y | - | K | ACIK | ACIK |
| Y | - | - | Y | J | AI | ABIJ |
| Y | Y | Y | - | O | ACEGIKMO | ACEGIKMO |
| Y | Y | - | Y | N | AEIM | ABEFIJMN |
| Y | - | Y | Y | L | ACIK | ABCDIJKL |
| Y | Y | Y | Y | P | ACEGIKMO | A thru P |
| - | Y | - | - | E | AE | AE |
| - | Y | Y | - | G | ACEG | ACEG |
| - | Y | - | Y | F | AE | ABEF |
| - | Y | Y | Y | H | ACEG | A thru H |
| - | - | Y | - | C | AC | AC |
| - | - | - | Y | B | A | AB |
| - | - | Y | Y | D | AC | ABCD |
| - | - | - | - | A | A | A |

Table 16B (below). Monthly and annual test failure QC codes, indicating if a normals data value failed a QC check in a QC category. AF@ indicates the value failed a test in the specified category. A-@ indicates either the value passed all relevant tests in this category, or none of the tests in this category were applied to this value (the code in column 37 will aid the user in determining if tests in the indicated category were applied). >#= indicates Adoes not apply@ (this code not used for monthly data values).

| Test Failed | | | | QC Code for Monthly | QC Code for Annual |
|---|---|---|---|---|---|
| Abs | Int | Com | Year | Value | Value |
| F | - | - | - | I | I |
| F | F | - | - | M | M |
| F | - | F | - | K | K |
| F | - | - | F | # | J |
| F | F | F | - | O | O |
| F | F | - | F | # | N |
| F | - | F | F | # | L |
| F | F | F | F | # | P |
| - | F | - | - | E | E |
| - | F | F | - | G | G |
| - | F | - | F | # | F |
| - | F | F | F | # | H |
| - | - | F | - | C | C |
| - | - | - | F | # | B |
| - | - | F | F | # | D |
| - | - | - | - | A | A |

The specific tests that were applied in each category are discussed in Appendix A-2: QC Tests.

Data entry and keying errors that were flagged by the QC tests were corrected. For the remaining values that were flagged, the consistency of the differences or ratios among the 12 months was examined in a search for systematic differences. Suspect data were examined manually and were adjusted if problem resolution (for example, digits transposed, missing negative sign, decimal point off, values not in requested units) were possible. In some cases the contributing Member provided revised values. After the adjustments and revisions were applied, the data were again subjected to the complete suite of QC tests.

**11. Essential Companion Datasets**: None.

**12. References**: No information provided with original documentation.

## Appendix A-1: Data and Metadata Code Tables

**Table 1.** Region number codes assigned by the NCDC.

| Code | Region |
|---|---|
| 1 | WMO Region I: Africa |
| 2 | WMO Region II: Asia |
| 3 | WMO Region III: South America |
| 4 | WMO Region IV: North and Central America |
| 5 | WMO Region V: South-West Pacific |
| 6 | WMO Region VI: Europe |
| 7 | Antarctic Stations |

**Table 2.** Country identifier code assigned by the NCDC.

| Code | Country or Territory Name |
|---|---|
| AA | ARGENTINA (ANTARCTIC STATIONS) |
| AB | ALBANIA |
| AC | CHILE (ANTARCTIC STATIONS) |
| AG | ARGENTINA |
| AH | AFGHANISTAN, ISLAMIC STATE OF |
| AJ | AZERBAIJAN |
| AL | ALGERIA |
| AM | UNITED STATES OF AMERICA (ANTARCTIC STATIONS) |
| AN | ANGOLA |
| AP | JAPAN (ANTARCTIC STATIONS) |
| AR | ARMENIA |
| AS | AUSTRALIA (ANTARCTIC STATIONS) |
| AU | AUSTRALIA |
| B1 | BAHRAIN |
| B2 | BELIZE |
| B3 | BENIN |
| BA | BAHAMAS |
| BG | GUYANA |
| BH | BOSNIA AND HERZEGOVINA |
| BL | BELARUS |
| BP | BRUNEI DARUSSALAM |
| BU | BULGARIA |
| BX | BELGIUM |
| BZ | BRAZIL |
| C1 | COLOMBIA (SAN ANDRES AND PROVIDENCIA ISLANDS) |
| CH | CHILE |
| CN | CANADA |
| CO | COLOMBIA |
| CS | COSTA RICA |
| CU | CUBA |
| CV | CAPE VERDE |
| CY | CYPRUS |
| CZ | CZECH REPUBLIC |
| D1 | DJIBOUTI |
| DL | GERMANY |
| DN | DENMARK |
| DO | DOMINICA |
| DR | DOMINICAN REPUBLIC |
| E1 | ERITREA |

| | |
|---|---|
| EJ | FIJI |
| EQ | ECUADOR |
| ES | ESTONIA |
| F1 | FRANCE (ISLANDS IN THE INDIAN OCEAN) |
| FG | FRANCE (FRENCH DEPARTMENT OF GUYANA) |
| FI | FINLAND |
| FM | MOROCCO |
| FP | FRENCH POLYNESIA |
| FR | FRANCE |
| GA | GEORGIA |
| GL | GREENLAND |
| GN | GABON |
| GP | FRANCE (CARIBBEAN ISLANDS, GUADELOUPE, MARTINIQUE) |
| GR | GREECE |
| GW | GUINEA |
| HK | HONG KONG |
| HO | HONDURAS |
| HR | CROATIA |
| HU | HUNGARY |
| IE | IRELAND |
| IL | ICELAND |
| IN | INDIA |
| IR | IRAN, ISLAMIC REPUBLIC OF |
| IS | ISRAEL |
| IV | IVORY COAST |
| IY | ITALY |
| JP | JAPAN |
| K1 | KOREA, DEMOCRATIC PEOPLE'S REPUBLIC OF |
| KM | CAMEROON |
| KN | KENYA |
| KO | KOREA, REPUBLIC OF |
| KS | KAZAKSTAN (ASIA) |
| KW | KUWAIT |
| KY | KYRGYZ REPUBLIC |
| KZ | KAZAKSTAN (EUROPE) |
| LA | LAO PEOPLE'S DEMOCRATIC REPUBLIC |
| LB | LEBANON |
| LU | LITHUANIA |
| LV | LATVIA |
| LX | LUXEMBOURG |
| M1 | MALI |
| MA | MAURITIUS |
| MC | THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA |
| MD | MOLDOVA, REPUBLIC OF |
| MG | MADAGASCAR |
| ML | MALTA |
| MM | MYANMAR |
| MO | MONGOLIA |
| MS | MALAYSIA |
| MV | MALDIVES |
| MW | MALAWI |
| MX | MEXICO |
| NA | NETHERLANDS ANTILLES AND ARUBA |
| NC | NEW CALEDONIA |
| NI | NIGERIA |
| NK | NICARAGUA |
| NL | NETHERLANDS |
| NO | NORWAY |

| | |
|---|---|
| NZ | NEW ZEALAND |
| OS | AUSTRIA |
| PA | PORTUGAL (MADEIRA) |
| PC | CHINA |
| PH | PHILIPPINES |
| PK | PAKISTAN |
| PL | POLAND |
| PO | PORTUGAL |
| PR | PERU |
| PY | PARAGUAY |
| QR | QATAR |
| RA | RUSSIAN FEDERATION (ASIA) |
| RE | RUSSIAN FEDERATION (EUROPE) |
| RO | ROMANIA |
| RW | RWANDA |
| S1 | SLOVAKIA |
| S2 | SLOVENIA |
| S3 | SRI LANKA |
| SA | SPAIN (CANARY ISLANDS, CEUTA AND MELILLA) |
| SC | SEYCHELLES |
| SD | SAUDI ARABIA |
| SG | SENEGAL |
| SL | SIERRA LEONE |
| SN | SWEDEN |
| SO | SOLOMON ISLANDS |
| SP | SPAIN |
| SR | SINGAPORE |
| SU | SUDAN |
| SV | EL SALVADOR |
| SW | SWITZERLAND |
| SY | SYRIAN ARAB REPUBLIC |
| TD | TRINIDAD AND TOBAGO |
| TE | CHAD |
| TG | TOGO |
| TH | THAILAND |
| TJ | JORDAN |
| TK | TAJIKISTAN |
| TN | TANZANIA, UNITED REPUBLIC OF |
| TS | TUNISIA |
| TU | TURKEY |
| TX | TURKMENISTAN |
| U1 | UNITED STATES OF AMERICA (PACIFIC ISLANDS) |
| UA | SOUTH AFRICA |
| UB | EGYPT |
| UE | UNITED ARAB EMIRATES |
| UK | UNITED KINGDOM OF GREAT BRITAIN & NORTHERN IRELAND |
| UP | UKRAINE |
| US | UNITED STATES OF AMERICA |
| UY | URUGUAY |
| UZ | UZBEKISTAN |
| VN | VENEZUELA |
| YG | YUGOSLAVIA |
| ZA | ZAMBIA |
| ZI | ZIMBABWE |

**Table 3.** National station identification code.

| Code | Description |
|---|---|
| 0 | national station number assigned by Member |
| 1 | for U.S.A., national station number is from the Cooperative Station Network |
| 2 | for U.S.A., national station number is the WBAN station number |
| 3 | national station number assigned by the NCDC for internal data processing purposes |
| blank | no national station identification number |

**Table 4.** WMO international index station number flag assigned by NCDC.

| Flag | Description |
|---|---|
| 1 | WMO international index station number provided by Member |
| 2 | WMO international index station number determined by the NCDC from other sources (i.e., WMO Publication No. 9, Vol. A-Stations; Monthly Climatic Data for the World CLIMAT-reporting station list; Federal Climate Complex master station file; Global Historical Climatology Network files) |
| 3 | WMO international index station number is a pseudo number assigned by the NCDC for internal data processing purposes |

**Table 5.** Standard/provisional normal and homogeneity indicator code.

| Code | Description |
|---|---|
| 1 | standard normal based on nonhomogeneous data whose heterogeneities were adjusted |
| 2 | standard normal based on nonhomogeneous data whose heterogeneities were not adjusted |
| 3 | standard normal based on data that were not examined for homogeneity |
| 4 | standard normal based on data for which the examination, heterogeneity determination, and any adjustments were done using an automated process |
| 5 | provisional normal due to an insufficient period of record |
| 8 | standard normal, not known if data were examined for inhomogeneities |

**Table 6.** Climatic element codes, element units (may also depend on statistic, indicated by *), and element description.

| Code | Units | Description |
|---|---|---|
| 01 | deg C | Mean Dry Bulb Temperature |
| 02 | deg C | Maximum Dry Bulb Temperature |
| 03 | deg C | Minimum Dry Bulb Temperature |
| 04 | deg C | Wet Bulb Temperature |
| 05 | deg C | Dew Point Temperature |
| 06 | mm | Precipitation |
| 08 | mm | Maximum 24-Hour Precipitation |

| | | |
|---|---|---|
| 09 | cm | Snowfall |
| 10 | cm | Snow Depth |
| 11 | % | Relative Humidity |
| 12 | hPa | Sea Level Pressure |
| 13 | hPa | Station Pressure |
| 14 | hPa | Vapor Pressure |
| 15 | * | Sunshine |
| 16 | m/sec | Wind Speed |
| 17 | degrees | Wind Direction |
| 18 | unitless | Wind Steadiness |
| 19 | deg C | Soil Temperature |
| 20 | okta | Sky Cover (Cloud Cover) |
| 21 | mm | Pan Evaporation |
| 28 | m | Height of 1000 hPa Geopotential Level |
| 29 | m | Height of 850 hPa Geopotential Level |
| 30 | m | Height of 700 hPa Geopotential level |
| 32 | $MJ/m^2$ | Net Solar Radiation |
| 33 | $MJ/m^2$ | Global Solar Radiation |
| 34 | $MJ/m^2$ | Diffuse Solar Radiation |
| 35 | $MJ/m^2$ | Reflected Solar Radiation |
| 36 | $MJ/m^2$ | Atmospheric Solar Radiation |
| 37 | $MJ/m^2$ | Terrestrial Solar Radiation |
| 38 | mm | Piche Evaporation |
| 39 | mm | Rainfall |
| 40 | * | Bright Sunshine |
| 48 | * | Calm Winds |
| 49 | count | Number Days with Sandstorm/Thick Dust/Haze |
| 50 | count | Number Days with Measurable Bright Sunshine |
| 51 | count | Number Days with Thunder |
| 52 | count | Number Days with Lightning |
| 53 | count | Number Days with Hail |
| 54 | count | Number Days with Rainfall GE Threshold |
| 55 | count | Number Days with Rain Showers |
| 56 | count | Number Days with Snow |
| 57 | count | Number Days with Snow on Ground |
| 58 | count | Number Days with Fog/Ice Fog |
| 59 | count | Number Days with Fog - Sky Obscured |
| 60 | count | Number Days with Fog - Sky Unobscured |
| 61 | count | Number Days with Haze/Smoke |
| 62 | count | Number Days with Dust |
| 63 | count | Number Days with Blowing Dust/Sand |
| 65 | count | Number Days with Visibility LE Threshold |
| 73 | count | Number Days with no Sunshine |
| 74 | count | Number Days with Dew |
| 75 | count | Number Days with Rime/Glaze Ice |
| 76 | count | Number Days with Air Frost |
| 77 | count | Number Days with Grass Frost |
| 82 | count | Number Days with Gale Force Winds |
| 83 | count | Number Days Maximum Temperature GE Threshold |
| 84 | count | Number Days Maximum Temperature LE Threshold |
| 85 | count | Number Days Minimum Temperature LE Threshold |
| 86 | count | Number Days Minimum Temperature GE Threshold |
| 87 | count | Number Days Mean Temperature GE Threshold |
| 89 | count | Number Days with Dust/Haze/Mist |
| 90 | count | Number Days Maximum Temperature GT Threshold |
| 91 | count | Number Days Maximum Temperature LT Threshold |
| 92 | count | Number Days Minimum Temperature GT Threshold |
| 93 | count | Number Days Minimum Temperature LT Threshold |

| | | |
|---|---|---|
| 94 | count | Number Days with Snowfall GE Threshold |
| 95 | count | Number Days with Precipitation GE Threshold |
| 96 | count | Number Days with Snow Cover GE Threshold |
| 97 | count | Number Days with Freezing Rain/Drizzle |
| 98 | count | Number Days with Blowing Snow |
| AA | count | Number Days with Rain/Drizzle |
| AB | count | Number Days with Snow/Hail |
| AC | count | Number Days with Fog/Mist |
| AD | count | Number Days with Weather Phenomena |
| AE | count | Number Days with Ice Storm |
| AF | count | Number Days with Thick Haze |
| AG | count | Number Days with Rising Sand |
| AH | count | Number Days with Mist |
| AI | count | Number Days with Squalls |
| AJ | count | Number Days with Duststorm/Sandstorm |
| BH | count | Number Days Mean Temperature LT Threshold |
| BJ | count | Number Days with Fog |
| BM | count | Number Days with Daily Maximum Wind Speed GE Threshold |
| BT | count | Number Days with Occurrence of Rain |
| BW | count | Number Days with Daily Maximum Snow Cover GE Threshold |

**Table 7.** Statistic codes and description.

| Code | Description |
|---|---|
| 01 | Mean Value |
| 02 | Median Value |
| 03 | Standard Deviation of Mean Value |
| 04 | Maximum Value |
| 05 | Minimum Value |
| 06 | Mean Daily Value |
| 08 | Standard Deviation of Mean Daily Value |
| 09 | Mean Daily Maximum Value |
| 10 | Mean Daily Minimum Value |
| 11 | Maximum Daily Value |
| 12 | Date (Year/Day) of Occurrence of Maximum Daily Value |
| 13 | Minimum Daily Value |
| 14 | Date (Year/Day) of Occurrence of Minimum Daily Value |
| 15 | Mean Monthly Value |
| 16 | Standard Deviation of Mean Monthly Value |
| 18 | Mean Monthly Maximum Value |
| 19 | Mean Monthly Minimum Value |
| 20 | Minimum Monthly Value |
| 21 | Year of Occurrence of Minimum Monthly Value |
| 22 | First Quintile |
| 23 | Second Quintile |
| 24 | Third Quintile |
| 25 | Fourth Quintile |
| 26 | Maximum Monthly Value |
| 27 | Year of Occurrence of Maximum Monthly Value |
| 30 | Maximum Gust |
| 37 | Percent of Possible |
| 38 | Percent Frequency |
| 41 | Prevailing |
| 42 | Vector |
| 44 | Mean Number of Hours |
| 45 | Mean - Sunrise to Sunset |

| | |
|---|---|
| 51 | Mean on Last Day of Month |
| 53 | Percent of Daylight Hours |
| 55 | Year of Occurrence of Maximum Value |
| 56 | Year of Occurrence of Minimum Value |
| 57 | Mean Percent |
| 58 | First Quartile |
| 59 | Third Quartile |
| 60 | Standard Deviation of 3-Hourly Values |
| 64 | Total Count for Period of Record |
| 69 | Mean of Hourly Observations |
| 70 | Mean of Observations at 0000 LST |
| 71 | Mean of Observations at 0100 LST |
| 72 | Mean of Observations at 0200 LST |
| 73 | Mean of Observations at 0300 LST |
| 74 | Mean of Observations at 0400 LST |
| 75 | Mean of Observations at 0500 LST |
| 76 | Mean of Observations at 0600 LST |
| 77 | Mean of Observations at 0700 LST |
| 78 | Mean of Observations at 0800 LST |
| 79 | Mean of Observations at 0900 LST |
| 80 | Mean of Observations at 1000 LST |
| 81 | Mean of Observations at 1100 LST |
| 82 | Mean of Observations at 1200 LST |
| 83 | Mean of Observations at 1300 LST |
| 84 | Mean of Observations at 1400 LST |
| 85 | Mean of Observations at 1500 LST |
| 86 | Mean of Observations at 1600 LST |
| 87 | Mean of Observations at 1700 LST |
| 88 | Mean of Observations at 1800 LST |
| 89 | Mean of Observations at 1900 LST |
| 90 | Mean of Observations at 2000 LST |
| 92 | Mean of Observations at 2200 LST |
| 93 | Mean of Observations at 2300 LST |
| 94 | Mean of 3-Hourly Observations |
| 97 | Mean of Synoptic Observations |
| 98 | Number of Years used to Calculate Normal |
| AF | Afternoon Average |
| AM | Daytime Average |
| MO | Morning Average |
| PM | Nighttime Average |

**Table 8.** Explanation of element-statistic qualifier codes. The following qualifiers were used for the indicated element (Elem) and statistic (Stat) code combinations.

| Elem Code | Stat Code | Qualifier Code | Description |
|---|---|---|---|
| (any) | (any) | blank | qualifier not specified |
| (any) | (any) | an integer number | the qualifier code is defined in Table 7 |
| (any) | (any) | a 2-letter code | the qualifier code is defined in Table 7 |
| 15 | 44 | NCDC | mean monthly number of hours of sunshine computed by the NCDC from mean daily values provided by the Member |

| | | | |
|---|---|---|---|
| 17 | (any) | a decimal number | the number is the mean direction the wind is blowing from, in compass degrees |
| 19 | (any) | a decimal number | the number is depth at which the soil temperature was measured |
| 21 | 15 | a decimal number | the size of the evaporimeter, in $cm^2$ |
| 54 | (any) | a decimal number | rainfall amount threshold value, in mm |
| 65 | 15 | a decimal number | visibility threshold value, in km |
| 83-87 | (any) | a decimal number | temperature threshold value, in deg C |
| 90-93 | (any) | a decimal number | temperature threshold value, in deg C |
| 94 | (any) | a decimal number | snowfall amount threshold value, in cm |
| 95 | (any) | a decimal number | precipitation amount threshold value, in mm |
| 96 | (any) | a decimal number | snow cover amount threshold value, in cm |
| BH | 15 | a decimal number | temperature threshold value, in deg C |
| BM | 15 | a decimal number | wind speed threshold value, in m/sec |
| BW | 15 | a decimal number | snow cover amount threshold value, in cm |

## Appendix A-2: QC Tests

This appendix describes the range of specific tests that were performed in each of the four QC test categories. The specific tests that were actually performed depended on the elements and statistics submitted by the Member.

### A. SPECIFIC ABSOLUTE LIMITS CHECKS.

Table 9. The element-statistic-qualifier codes that were subjected to extreme limits checks, and their lower and upper limits.

| element code | statistic code | description | lower limit | upper limit |
|---|---|---|---|---|
| 01 | 01,06,15 | mean temperature (see Note 9-1) | -34oC | 40oC |
| 02 | 01,09,18 | average maximum temperature | -40oC | 50oC |
| 02 | 04,11,26 | extreme maximum temperature | 0oC | 60oC |
| 03 | 01,10,19 | average minimum temperature (see Note 9-1) | -50oC | 30oC |
| 03 | 05,13,20 | extreme minimum temperature | -70oC | 35oC |
| 04 | 01,54,94 | wet bulb temperature | -60oC | 50oC |
| 05 | 01,15,54, 94 | dew point temperature | -60oC | 50oC |
| 06,39 | 15 | monthly total precipitation | 0mm | 3000mm |
| 09 | 15 | monthly total snowfall | 0cm | 1000cm |
| 11 | (any) | relative humidity | 0% | 100% |
| 12 | 01,94 | mean sea level pressure (hPa) | 990 | 1040 |
| 13 | 01,69 | mean station atmospheric pressure (hPa) | 500 | 1040 |
| 14 | 01 | mean vapor pressure (hPa) | 0 | 40 |
| 15,40 | 44 | mean daily sunshine duration (qualifier 06) (hrs) | 0 | 24 |
| 15,40 | 44 | mean monthly sunshine duration (hrs) | 0 | 744 |
| 16 | 01 | mean wind speed (m/sec) | 0 | 10 |
| 17 | 30,41,42 | prevailing wind direction | 0 | 360 |
| 20 | 01 | mean sky (cloud) cover (oktas) | 0 | 8 |
| 45 | (any) | frequency counts (see note 9-2) | 0 | - |
| 49-AJ, BH-BW | 15 | monthly number of days with various weather elements (see note 9) | 0 | 28, 30,31 |
| 54,95 | 02,15 | monthly number of days with rainfall/precipitation >= a threshold (see Note 9-3) | 0 | 28, 30,31 |
| BT | 15 | monthly number of days with rain (threshold not indicated) (see Note 9-3) | 0 | 28, 30,31 |
| 51,52, 53,58 | 03 | standard deviation | 0 | 2 |
| 20 | 03 | standard deviation | 0 | 3 |
| 01,02, 03,14, 19,21, 33 | 03,08 | standard deviation | 0 | 5 |
| 15 | 08 | standard deviation | 0 | 5 |
| 04,05, 11,12, 13,16, 54,95 | 03,60 | standard deviation | 0 | 10 |
| 08 | 03 | standard deviation | 0 | 130 |

| | | | | |
|---|---|---|---|---|
| 15,40 | 03,17 | standard deviation | 0 | 200 |
| 06 | 03 | standard deviation | 0 | 250 |
| (any) | 12,14 | year/day of occurrence of daily extreme (see Note 9-4) | BYR | EYR |
| (any) | 21,27,55, 56 | year of occurrence of monthly extreme (see Note 9-4 for BYR & EYR definitions) | BYR | EYR |
| (any) | 38-40 | percent frequency | 0% | 100% |
| (any) | 48,98 | number of years of data normals based on (see Note 9-5) | 0 | NYRS |

Note 9-1: For stations in Russia, Mongolia, and Antarctica, mean temperature lower limit was -50oC and average minimum temperature lower limit was -60oC.

Note 9-2: Upper limit not checked for frequency counts.

Note 9-3: Upper limit was the maximum possible number of days in a month, the specific value depends on the month.

Note 9-4: Lower limit is day 01 of the first year of the period which the extremes are based on (BYR, columns 18-21 of the data record); upper limit is the 29th, 30th, or 31st (depending on month of year) of the last year of the period which the extremes are based on (EYR, columns 22-25 of the data record).

Note 9-5: Upper limit is the maximum number of years possible, NYRS=EYR-BYR+1 (see Note 9-4 for EYR & BYR definitions).

**B. SPECIFIC INTERNAL CONSISTENCY CHECKS BETWEEN ELEMENTS AND STATISTICS.**

1. Number of days with temperatures consistency check:

(NDTmax >= $T_i$) *greater than or equal to* (NDTmax >= $T_{i+1}$)
(NDTmax <= $T_i$) *less than or equal to* (NDTmax <= $T_{i+1}$)
(NDTmin >= $T_i$) *greater than or equal to* (NDTmin >= $T_{i+1}$)
(NDTmin <= $T_i$) *less than or equal to* (NDTmin <= $T_{i+1}$)
(NDTmean >= $T_i$) *greater than or equal to* (NDTmean >= $T_{i+1}$)
(NDTmean <= $T_i$) *less than or equal to* (NDTmean <= $T_{i+1}$)
(NDTmax > $T_i$) *greater than or equal to* (NDTmax > $T_{i+1}$)
(NDTmax < $T_i$) *less than or equal to* (NDTmax < $T_{i+1}$)
(NDTmin > $T_i$) *greater than or equal to* (NDTmin > $T_{i+1}$)
(NDTmin < $T_i$) *less than or equal to* (NDTmin < $T_{i+1}$)

where

NDTmax = number of days with maximum temperature,
NDTmin = number of days with minimum temperature,
NDTmean = number of days with mean temperature,
$T_i$ = a temperature threshold value,
$T_{i+1}$ = a temperature threshold value > $T_i$.

2. Number of days with precipitation consistency check:

(NDPrecip >= $X_i$) *greater than or equal to* (NDPrecip >= $X_{i+1}$)
(NDRain >= $X_i$) *greater than or equal to* (NDRain >= $X_{i+1}$)
(NDSF >= $X_i$) *greater than or equal to* (NDSF >= $X_{i+1}$)
(NDSC >= $X_i$) *greater than or equal to* (NDSC >= $X_{i+1}$)

where

NDPrecip = number of days with precipitation,
NDRain = number of days with rain,
NDSF = number of days with snowfall,
NDSC = number of days with snow cover,
$X_i$ = a precipitation, rainfall, snowfall, or snow cover threshold value,
$X_{i+1}$ = a precipitation, rainfall, snowfall, or snow cover threshold value > $X_i$.

3. Temperature consistency check:

For a given temperature element,

(lowest {minimum} value) *less than or equal to* (mean value)
(mean value) *less than or equal to* (highest {maximum} value)

4. Cross-element temperature consistency check:

(extreme {coldest} minimum temperature) *less than*
(normal {average} minimum temperature)
(normal {average} minimum temperature) *less than*
(normal {average} mean temperature)
(normal {average} mean temperature) *less than*
(normal {average} maximum temperature)
(normal {average} maximum temperature) *less than*
(extreme {warmest} maximum temperature)

5. Precipitation quintiles consistency check:

0 <= Min <= Q1 <= Q2 <= Q3 <= Q4 <= Max where

Min = smallest monthly precipitation value,
Q1 = first (20%) monthly precipitation quintile,
Q2 = second (40%) monthly precipitation quintile,
Q3 = third (60%) monthly precipitation quintile,
Q4 = fourth (80%) monthly precipitation quintile,
Max = largest monthly precipitation value.

6. Atmospheric pressure consistency check:

(mean sea level pressure) *greater than or equal to* (mean station pressure)

Note: If a station's elevation is below sea level, then the station should be expected to fail this consistency check.

7. Monthly amount/number of days consistency check:

If Precip = 0, then NDPrecip should = 0.
If NDPrecip = 0, then Precip should = 0.
If SF = 0, then NDSF should = 0.
If NDSF = 0, then SF should = 0.

where Precip = total monthly precipitation amount,
SF = total monthly snowfall amount,
NDPrecip = number of days with precipitation,
NDSF = number of days with snowfall.

8. Precipitation amount consistency check:

Psmall <= (normal total precipitation) <= Plarge

where Psmall = smallest monthly precipitation amount,
Plarge = largest monthly precipitation amount.

C. SPECIFIC ELEMENTS COMPARED TO THE WORLD WEATHER RECORDS (WWR) 1971-1980 MEANS.

The 1961-1990 normals were compared to the WWR 1971-1980 means for those stations and elements that were available in both data sets. Two types of comparisons were made:

1. For mean temperature, station pressure, and sea level pressure, differences between the 1961-1990 normals and their corresponding WWR means were computed for all 12 months and the annual value. If the difference was greater than a specified threshold (a threshold was chosen to account for the fact that a 30-year mean was being compared to a 10-year mean), the value was flagged as failing the test. The magnitude of the thresholds were:

| | |
|---|---|
| mean temperature | 2.0 °C |
| station pressure | 3.0 hPa |
| sea level pressure | 3.0 hPa |

2. For monthly and annual total precipitation amount, the ratio between the 1971-1980 WWR means and the 1961-1990 normals was computed. If the ratio was significantly different from 1.0 (i.e., outside the range 0.6 to 1.4), the value was flagged as failing the test. (A range was chosen to account for the fact that a 30-year mean was being compared to a 10-year mean.) The following specific patterns were also checked for: (i) the ratio was approximately 10.0 or 0.1 (indicating a decimal placement error); (ii) the ratio was approximately 25.4 (indicating an English-Metric units difference); and (iii) the ratio was approximately 2.54 (indicating a combination of i and ii). For these three pattern checks, the value was flagged as failing the test if the ratio fell within a specified range. The ranges for these pattern tests were determined by manually examining a subset of the data and consisted of:

| | |
|---|---|
| (i) decimal placement error | 0.07 - 0.13 and<br>7.0 - 13.0 |
| (ii) English-Metric units error | 18.0 - 30.0 |
| (iii) combination (i) and (ii) | 1.8 - 3.00 |

Precipitation values near 0.0 result in unreliable or unrepresentative ratios. Consequently, no precipitation comparison was made if both the 10-year and 30-year means were less than or equal to 5.0 mm.

D. INTERNAL CONSISTENCY CHECK BETWEEN THE ANNUAL VALUE AND MONTHLY VALUES.

The annual value provided by the Member (designated here as ANNMEM) was compared to the annual value computed by the NCDC from the monthly values provided by the Member (designated here as ANNCOMP). If the two annual values differed by an amount greater than 0.05, then the ANNMEM value was flagged as failing this test. Both annual values were saved in the digital database.

Differences between ANNMEM and ANNCOMP could result from differences in rounding methodologies or differences in how the annual value was computed (i.e., an annual normal computed from the monthly normal values versus an annual normal computed by averaging the individual annual values from each year of the normals period). A value for ANNCOMP was computed only if all 12 months were non-missing and were not a trace value. The ANNCOMP value is the sum of the monthly normal values for the following elements:

total precipitation amount
snowfall amount
sunshine duration
evaporation
total rainfall amount
number of days

The ANNCOMP value is the average of the monthly normal values for the following elements:

temperature
relative humidity
atmospheric pressure
vapor pressure
wind speed
sky (cloud) cover

## Appendix A-3: Selected Tables Sorted By Name

This appendix contains two tables. Table 10 is Table 2 arranged by country name. Table 11 is Table 6 arranged by element name.

**Table 10.** Countries and Territories submitting normals data, and their country code, arranged by name.

| Code | Country or Territory Name |
|---|---|
| AH | AFGHANISTAN, ISLAMIC STATE OF |
| AB | ALBANIA |
| AL | ALGERIA |
| AN | ANGOLA |
| AG | ARGENTINA |
| AA | ARGENTINA (ANTARCTIC STATIONS) |
| AR | ARMENIA |
| AU | AUSTRALIA |
| AS | AUSTRALIA (ANTARCTIC STATIONS) |
| OS | AUSTRIA |
| AJ | AZERBAIJAN |
| BA | BAHAMAS |
| B1 | BAHRAIN |
| BL | BELARUS |
| BX | BELGIUM |
| B2 | BELIZE |
| B3 | BENIN |
| BH | BOSNIA AND HERZEGOVINA |
| BZ | BRAZIL |
| BP | BRUNEI DARUSSALAM |
| BU | BULGARIA |
| KM | CAMEROON |
| CN | CANADA |
| CV | CAPE VERDE |
| TE | CHAD |
| CH | CHILE |
| AC | CHILE (ANTARCTIC STATIONS) |
| PC | CHINA |
| CO | COLOMBIA |
| C1 | COLOMBIA (SAN ANDRES AND PROVIDENCIA ISLANDS) |
| CS | COSTA RICA |
| HR | CROATIA |
| CU | CUBA |
| CY | CYPRUS |
| CZ | CZECH REPUBLIC |
| DN | DENMARK |
| D1 | DJIBOUTI |
| DO | DOMINICA |
| DR | DOMINICAN REPUBLIC |
| EQ | ECUADOR |
| UB | EGYPT |
| SV | EL SALVADOR |
| E1 | ERITREA |
| ES | ESTONIA |
| EJ | FIJI |

| | |
|---|---|
| FI | FINLAND |
| FR | FRANCE |
| GP | FRANCE (CARIBBEAN ISLANDS, GUADELOUPE, MARTINIQUE) |
| FG | FRANCE (FRENCH DEPARTMENT OF GUYANA) |
| F1 | FRANCE (ISLANDS IN THE INDIAN OCEAN) |
| FP | FRENCH POLYNESIA |
| GN | GABON |
| GA | GEORGIA |
| DL | GERMANY |
| GR | GREECE |
| GL | GREENLAND |
| GW | GUINEA |
| BG | GUYANA |
| HO | HONDURAS |
| HK | HONG KONG |
| HU | HUNGARY |
| IL | ICELAND |
| IN | INDIA |
| IR | IRAN, ISLAMIC REPUBLIC OF |
| IE | IRELAND |
| IS | ISRAEL |
| IY | ITALY |
| IV | IVORY COAST |
| JP | JAPAN |
| AP | JAPAN (ANTARCTIC STATIONS) |
| TJ | JORDAN |
| KS | KAZAKSTAN (ASIA) |
| KZ | KAZAKSTAN (EUROPE) |
| KN | KENYA |
| K1 | KOREA, DEMOCRATIC PEOPLE'S REPUBLIC OF |
| KO | KOREA, REPUBLIC OF |
| KW | KUWAIT |
| KY | KYRGYZ REPUBLIC |
| LA | LAO PEOPLE'S DEMOCRATIC REPUBLIC |
| LV | LATVIA |
| LB | LEBANON |
| LU | LITHUANIA |
| LX | LUXEMBOURG |
| MG | MADAGASCAR |
| MW | MALAWI |
| MS | MALAYSIA |
| MV | MALDIVES |
| M1 | MALI |
| ML | MALTA |
| MA | MAURITIUS |
| MX | MEXICO |
| MD | MOLDOVA, REPUBLIC OF |
| MO | MONGOLIA |
| FM | MOROCCO |
| MM | MYANMAR |
| NL | NETHERLANDS |
| NA | NETHERLANDS ANTILLES AND ARUBA |
| NC | NEW CALEDONIA |
| NZ | NEW ZEALAND |
| NK | NICARAGUA |
| NI | NIGERIA |
| NO | NORWAY |

| | |
|---|---|
| PK | PAKISTAN |
| PY | PARAGUAY |
| PR | PERU |
| PH | PHILIPPINES |
| PL | POLAND |
| PO | PORTUGAL |
| PA | PORTUGAL (MADEIRA) |
| QR | QATAR |
| RO | ROMANIA |
| RA | RUSSIAN FEDERATION (ASIA) |
| RE | RUSSIAN FEDERATION (EUROPE) |
| RW | RWANDA |
| SD | SAUDI ARABIA |
| SG | SENEGAL |
| SC | SEYCHELLES |
| SL | SIERRA LEONE |
| SR | SINGAPORE |
| S1 | SLOVAKIA |
| S2 | SLOVENIA |
| SO | SOLOMON ISLANDS |
| UA | SOUTH AFRICA |
| SP | SPAIN |
| SA | SPAIN (CANARY ISLANDS, CEUTA AND MELILLA) |
| S3 | SRI LANKA |
| SU | SUDAN |
| SN | SWEDEN |
| SW | SWITZERLAND |
| SY | SYRIAN ARAB REPUBLIC |
| TK | TAJIKISTAN |
| TN | TANZANIA, UNITED REPUBLIC OF |
| TH | THAILAND |
| MC | THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA |
| TG | TOGO |
| TD | TRINIDAD AND TOBAGO |
| TS | TUNISIA |
| TU | TURKEY |
| TX | TURKMENISTAN |
| UP | UKRAINE |
| UE | UNITED ARAB EMIRATES |
| UK | UNITED KINGDOM OF GREAT BRITAIN & NORTHERN IRELAND |
| US | UNITED STATES OF AMERICA |
| AM | UNITED STATES OF AMERICA (ANTARCTIC STATIONS) |
| U1 | UNITED STATES OF AMERICA (PACIFIC ISLANDS) |
| UY | URUGUAY |
| UZ | UZBEKISTAN |
| VN | VENEZUELA |
| YG | YUGOSLAVIA |
| ZA | ZAMBIA |
| ZI | ZIMBABWE |

**Table 11.** Climatic elements and element codes, arranged by element name.

| Code | Name |
|---|---|
| 36 | Atmospheric Solar Radiation |

40 Bright Sunshine
48 Calm Winds
05 Dew Point Temperature
34 Diffuse Solar Radiation
33 Global Solar Radiation
28 Height of 1000 hPa Geopotential Level
30 Height of 700 hPa Geopotential level
29 Height of 850 hPa Geopotential Level
08 Maximum 24-Hour Precipitation
02 Maximum Dry Bulb Temperature
01 Mean Dry Bulb Temperature
03 Minimum Dry Bulb Temperature
32 Net Solar Radiation
83 Number Days Maximum Temperature GE Threshold
90 Number Days Maximum Temperature GT Threshold
84 Number Days Maximum Temperature LE Threshold
91 Number Days Maximum Temperature LT Threshold
87 Number Days Mean Temperature GE Threshold
BH Number Days Mean Temperature LT Threshold
86 Number Days Minimum Temperature GE Threshold
92 Number Days Minimum Temperature GT Threshold
85 Number Days Minimum Temperature LE Threshold
93 Number Days Minimum Temperature LT Threshold
76 Number Days with Air Frost
63 Number Days with Blowing Dust/Sand
98 Number Days with Blowing Snow
BW Number Days with Daily Maximum Snow Cover GE Threshold
BM Number Days with Daily Maximum Wind Speed GE Threshold
74 Number Days with Dew
62 Number Days with Dust
89 Number Days with Dust/Haze/Mist
AJ Number Days with Duststorm/Sandstorm
BJ Number Days with Fog
59 Number Days with Fog - Sky Obscured
60 Number Days with Fog - Sky Unobscured
58 Number Days with Fog/Ice Fog
AC Number Days with Fog/Mist
97 Number Days with Freezing Rain/Drizzle
82 Number Days with Gale Force Winds
77 Number Days with Grass Frost
53 Number Days with Hail
61 Number Days with Haze/Smoke
AE Number Days with Ice Storm
52 Number Days with Lightning
50 Number Days with Measurable Bright Sunshine
AH Number Days with Mist
BT Number Days with Occurrence of Rain
95 Number Days with Precipitation GE Threshold
AA Number Days with Rain/Drizzle
54 Number Days with Rainfall GE Threshold
55 Number Days with Rain Showers
75 Number Days with Rime/Glaze Ice
AG Number Days with Rising Sand
49 Number Days with Sandstorm/Thick Dust/Haze
56 Number Days with Snow
57 Number Days with Snow on Ground
AB Number Days with Snow/Hail

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  96 Number Days with Snow Cover GE Threshold
  94 Number Days with Snowfall GE Threshold
  AI Number Days with Squalls
  AF Number Days with Thick Haze
  51 Number Days with Thunder
  65 Number Days with Visibility LE Threshold
  AD Number Days with Weather Phenomena
  73 Number Days with no Sunshine
  21 Pan Evaporation
  38 Piche Evaporation
  06 Precipitation
  39 Rainfall
  35 Reflected Solar Radiation
  11 Relative Humidity
  12 Sea Level Pressure
  20 Sky Cover (Cloud Cover)
  10 Snow Depth
  09 Snowfall
  19 Soil Temperature
  13 Station Pressure
  15 Sunshine
  37 Terrestial Solar Radiation
  14 Vapor Pressure
  04 Wet Bulb Temperature
  17 Wind Direction
  16 Wind Speed
  18 Wind Steadiness
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